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ROYAL BOTANIC GARDENS, KEW.

BULLETIN

OF

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XLIII.—JOSEPH CHAMBERLAIN—IN MEMORIAM.

Amongst the tributes of memory called out by the passing of the great statesman Kew cannot be silent. For it owed to him, as to no other of our time, stimulus, encouragement and support. In his beautiful home at Highbury he found recreation in his garden from the labours of a strenuous political life. It was not the mere indulgence of a man of means; as with everything else it bore the impress of his own personality and practical ingenuity. An extensive range of glass was incorporated with the house; no outside pilgrimage was needed to visit it. An ample winter garden was a pleasant meeting ground for the family and its guests. Out of this opened a corridor with houses on either hand. A button by the side of each plate-glass door illuminated at night with electric light the interior display. These may seem trivial details: they are not so; they brought Mr. Chamberlain's favourite pursuits into the intimacy of his life. He took no exercise, nor did he find distraction in sports or games. Yet it was a fundamental principle with him that every man, however absorbed in the main pursuit in life, should find a hobby in something wholly remote from it. The physiological implication is sound; for distraction is rest, though not somnolent. Far from it: Mr. Chamberlain knew his plants; their origin and history were recorded in his garden books with his own hands It may seem a paradox; but the man who could hold a vast meeting spellbound was perhaps not less happy amongst his plants in a garden apron with a short pipe. Yet the secret is the same; he was above all things human. There have been statesmen in the past whose humanity needed some palliation.

It has been well said that the principle which animated Mr. Chamberlain's public life was desire for the welfare of the people, the nation and the race. As he passed from one field of activity to another that principle simply took a wider scope. In a wholly unofficial way it influenced his interest in Kew. To him, apart from its scientific aspects, it was the national garden. He was jealous that it should be up to the high-water mark of horticultural enterprise. But this requires now and again a generous expenditure possible to a possessor of private means, but not to a

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government establishment. The reason is that the one has a "margin," the other has not. It cannot be complained that Kew, in all essentials, is not liberally maintained; but every item of expenditure is ear-marked, and there is no room for an occasional however judicious extravagance. And this applies equally to other establishments maintained by the State, such as the British Museum and the National Gallery.

Mr. Chamberlain wanted the people to have the enjoyment at Kew of the best that a rich man could afford, and at least in one instance he helped it to circumvent the difficulty. He insisted that Kew should take up the cultivation of the splendid hybrids of *Hippeastrum*. These are costly to buy, and few private gardens can supply the special means for growing them successfully. Lieut.-Col. Sir George Holford, at Westonbirt, is without a rival in this respect, and is the possessor of a strain of exceptionally brilliant colour. To him Mr. Chamberlain appealed, and Sir George arrived one morning at Kew unexpectedly in a hansom cab laden with a noble burden of bulbs from his own collection. This gave Kew a start, and with some difficulty a house was adapted to grow them. Mr. Chamberlain had himself purchased from Messrs. Veitch at the price of £25 a single bulb of "*Grand Monarch*," a cross of exceptional merit: he allowed Kew to breed from it, and the result was "*Sir William*" and its progeny, a race with large flowers of splendid colour.

Kew possesses a collection of orchids which from a scientific point of view has no rival. It has been built up by the energy and cultural skill of the present Curator. Mr. Chamberlain thought that more concession should be made to popular taste in growing showy kinds of no more than horticultural attraction. Kew cannot afford to give a thousand guineas for an *Odontoglossum*; nor can it be expected to reflect every whim of passing fashion. Mr. Chamberlain contributed *Dendrobium* hybrids, the result of crosses made with his own hand. It must have been a gratification to him when in 1913 the munificence of Sir George Holford again realised his larger aim, and the Kew orchids can now appeal equally to the eye and to the intellect. It must not be supposed that in such matters his own taste was otherwise than refined and catholic. He had a wide knowledge of cultivated species. His "button-hole" was no affectation, but a note of affection for the plants from which official life kept him aloof. One night in the House of Commons the late Lord Avebury, then Sir John Lubbock, also appeared with an orchid in his button-hole. Mr. Chamberlain at once pounced upon it as something unknown to him. It was our native Butterfly orchid which Sir John had gathered that morning in his woods at High Elms. It is not trivial to touch on these matters. In drawing a portrait the small touches are at least as significant as the large outlines. Mr. Chamberlain's aim was throughout consistent; he desired that the splendour of a garden should not be the privilege only of the rich.

But he rendered an even greater service to Kew. The Great Temperate House was projected in 1855 by Sir William Hooker. It was designed as it now stands by Decimus Burton. In 1862 the

central portion and the octagons were finished. These were erected on a raised terrace on which space had been provided for the two wings. Their erection was, however, indefinitely postponed in 1863, although the foundations had been partially laid; part of the ironwork lay in the contractor's yard for many years, and was eventually broken up. The derelict condition of the terrace attracted Mr. Chamberlain's attention, and he asked for an explanation. He urged that the completion of the original design should be proceeded with. The First Commissioner of works (now Lord Gladstone) assented, and an estimate was prepared. When presented to the Chancellor of the Exchequer he at once put his pen through it with the remark, "a nation that requires a fleet, must do without a greenhouse." Sir William Harcourt, however, yielded in 1894 to a personal appeal from Mr. Chamberlain. Himself no mean gardener, the concession was perhaps not extorted very reluctantly. But it is at least certain that no one else could have obtained it, and Mr. Chamberlain was unaffectedly pleased at succeeding. In 1899 the work was completed; thirty-nine years had elapsed since its commencement. The new wings gave Kew what it had long wanted; a house for Himalayan plants and one for those of warm temperate countries.

In 1895 Mr. Chamberlain, with a change of ministry, became, perhaps somewhat to his surprise, Secretary of State for the Colonies. This is not the place for political history. But he brought to the vast field of Imperial affairs the same spirit which had animated him in a more limited. No detail was too insignificant for his attention. It is common knowledge that he raised the work of the Colonial Office to a position of distinction and efficiency which it had reached under no previous minister. He had the gift of carrying with him the enthusiasm of all who worked under him. His personal relations with the cultural work of Kew became less intimate for, as he said, "When a man is a Cabinet Minister, he can see little of his friends." But he made ample use officially of another aspect of its work as the adviser of the Government in all that concerns botanical enterprise in the Colonies.

One of the earliest questions to engage Mr. Chamberlain's attention was the depressed conditions of the West Indies. Their staple industry, the production of cane-sugar, had become unprofitable owing to the competition of beet-sugar supported by the bounty-system. The labourers on the estates thrown out of employment were starving, and revenues were dwindling. A Royal Commission of Enquiry, of which Sir Edward Grey and Sir David Barbour, K.C.S.I., were members, was appointed in 1897, and Dr. Morris (now Sir Daniel), the Assistant Director of Kew, was borrowed as expert adviser. As the result of its report a new Agricultural Department was created in 1898, and Dr. Morris left Kew to take up the post of Commissioner of Agriculture. The problem to be faced was not easy. Unemployed labour had to be absorbed; this could only be done by converting it into a peasant-proprietary. New staples were introduced, notably cotton, suited to such a system. But the peasants had to be instructed in their cultivation, and Kew was largely drawn

upon to supply Instructors. Sugar, however, was not neglected; every effort was made in Barbados to raise seedlings which would repay the cultivator by a more productive yield. The result has more than answered expectations; prosperity has been re-established with an increased revenue and an ampler trade.

In West Africa Mr. Chamberlain had to deal with a similar problem, though from different causes. The enforcement of peace and order necessitated an internal revenue, and this could only be produced by inducing the natives to engage in agriculture. Again the resources of Kew had to be drawn upon. The volume of its official work constantly increased, and in order to facilitate it the Director in 1902 was given an official status at the Colonial Office as Botanical Adviser to the Secretary of State for the Colonies.

These things, and they are enough to recall, are overshadowed by greater in the public eye. But Kew may say:—

Forsan et haec olim meminisse juvabit.

It was its privilege to see the human side of a great statesman. What love he could spare from the interests of his country he gave to plants. During his visit to South Africa the Barberton Daisy won his heart, and he brought it back as a personal trophy, hoping to do great things with it at Highbury.

Let this be for "Rosemary, that's for remembrance."

W. T. T. D.

XLIV.—NEW EUPHORBIACEAE FROM INDIA AND MALAYA.

A. T. GAGE.

Euphorbia (Anisophyllum) katrajensis, *Gage; E. erythrocladae,* Boiss., affinis, sed foliis majoribus linearibus vel sublinearibus et seminibus pustulatis differt.

Herba erecta, involucris exceptis omnino glabra, ad 40 cm. alta; caulis teres vel subteres, leve brunneus vel viridis, 2–4 mm. crassus, dichotome ramosus sed saepe sympodialis, internodiis 1–5·5 cm. longis; rami cauli similes sed minores. *Folia* opposita, brevissime petiolata, stipulata; lamina oblongo-elongata, vel late linearis, membranacea, 2·5–6·5 cm. longa, 3–8 mm. lata, apice rotundata vel subacuta vel apiculata, margine arcte serrulata, basi inaequilateraliter semicordata vel semiauriculata; pagina superior levi-viridis, sub lente minute punctata; pagina inferior glauca vel subglauca; costa media utrinque prominens; nervi utrinque obscuri; nervi basilares in costae mediae parte non auriculata 3–4, in parte auriculata 4–7, nervo in utraque parte summo validissimo excurvato; nervi laterales in costae mediae utraque parte 7–15 excurvati, inter se et inter nervos summos basilares anastomosantes; reticulatio ultima nonnihil crassa, polygonalis; petiolus vix 2 mm. longus, supra canaliculatus; stipulae interpetiolares, minutae, triangulares, fimbriatae. *Involucra* in caulis et ramorum axillis solitaria, pedicellata (pedicellis 1–8 mm. longis) turbi-

nata, circa 2·5 mm. longa; lobi 5, glandulas fere aequantes, oblongo-quadrati, fimbriati, intus parce villosi; glandulae 4, appendiculatae, sessiles, obconico-ellipticae, intus villosae, extra glabrae, apice transverse elliptico levi leviter concavo; glandularum appendiculae subaequales, suboblique late obcuneatae, circa 1 mm. longae, marginibus lateralibus integris, margine apicali crenulato. *Flores* ♂ pauci, cum bracteolis paucis plumosis. *Capsula* matura subpyramidaliter trilobata, sulcata, circa 3 mm. diametro; cocci rotundati, subcarinati; styli liberi, vix 0·5 mm. longi, bifidi; stigmata ovoidea, levissime incrassata. *Semina* late ovoideo-tetragona, circa 2 mm. longa, rubro-brunnea, pustulate leprosa, basi truncata peltate insculpta, apice subacuto e ventre oblique truncato; caruncula obsoleta.

India. Bombay Presidency: Katraj Hills, *Kanetkar, Shevade* (Herb. Poona).

Euphorbia (**Anisophyllum**) **minbuensis,** *Gage; E. granulatae*, Forsk., affinis, foliis in ramulis quam in ramis multo minoribus imbricatis, glandularum limbis crenulatis vel lobulatis diversa.

Herba parva, prostrata vel decumbens, ramosissima, ad 40 cm. diffusa, puberula. *Radix* teres, 1·5–3 mm. crassa. *Caules* vel rami primarii inferne teretes, superne leviter angulati, breviter puberuli, 1–2 mm. crassi, ad apices involucriferi; ramuli alterni, involucriferi, 1–4 cm. longi; internodia in ramis primariis 0·6–1 cm. longa. *Folia* disticha, stipulata, brevissime petiolata, in ramulis subimbricata; lamina coriacea, utrinque levi-viridis et sub lente minute punctata, obliquissime ovata, in caulibus et ramis primariis 0·5–1·2 cm. longa, 3–7 mm. lata, pagina superiore glabra vel parce puberula, pagina inferiore breviter puberula, apice rotundata vel leviter retusa vel mucronulata, basi valde inaequilateraliter rotundata, semiauriculata vel semicordata margine integro vel distanter serrulato; in ramulis lamina 2–5 mm. longa et plerumque utrinque valde puberula; costa media in pagina inferiore leviter prominens; nervi basilares in costae mediae parte auriculata 3–4, in parte altera 2–3, excurvati; nervi laterales costae mediae utraque parte 4–6; nervi omnes arborescenter anastomosantes, nervulis ultimis caecis; petiolus brevissimus, subteres, supra canaliculatus, puberulus; stipulae interpetiolares, lanceolatae vel anguste triangulares, puberulae, ciliolatae. *Involucra* solitaria, alternatim in axillis caulis et ramorum superioribus et in axillis ramulorum disposita, breviter valde pedicellata, circa 3 mm. longa (pedicello 1·5 mm. longo incluso), turbinata, extra puberula, intus parce subsetulose puberula glandulas adversus; lobi 5, glandulas fere aequantes, minuti, triangulari-lanceolati, ciliati; glandulae 4, appendiculatae, breviter late stipitatae, obconico-ellipticae, apice leviter concavo leve glabro, circa 0·5 mm. in diametro; limbi subintegri vel crenulati vel lobulati, glandularum latitudinem fere aequantes. *Flores* ♂ numerosi, pedicellis villosis. *Capsula* matura subglobosa, trilobata, sulcata, dense villosa, circa 2 mm. diametro; cocci subcarinati; styli brevissimi, puberuli, fere ad basem liberi, bifidi; stigmata ovoidea, incrassata. *Semina* ovoideo-tetragona, circa 1·5 mm. longa, rubro-brunnea, subtiliter granulata, obscure

transverse plurisulcata, apice subacuto e ventre oblique truncato ecarunculato, basi subtruncata, peltate insculpta.

Burma. Minbu district: Sidoktaya, *Shaik Mokim* 370, 415; Legain, *Shaik Mokim* 716; Minbu Town, *Shaik Mokim* 992.

Euphorbia (Tithymalus) perbracteata, *Gage; E. dracunculoidi,* Lamk., affinis, sed bracteis connatis et seminibus levibus differt.

Herba erecta, ad 40 cm. alta, involucris exceptis omnino glabra. *Radix* teres, plus minusve tortuosa, lignosa, circa 3 mm. crassa. *Caulis* teres, stramineus vel fuscus, circa 3 mm. crassus, irregulariter foliatus, internodiis 0·4–3 cm. longis; rami cauli similes sed minus validi, simplices vel ad apices in umbellas divisi. *Folia* alterna, sessilia, exstipulata, linearia, membranacea, 1·5–6 cm. longa, 2–5 mm. lata, viridia, concoloria, apice breviter acuta, basi leviter inaequilateraliter obtusa, margine integro; costa utrinque prominens; nervi obscuri. *Inflorescentia* umbelliformis, in caule et ramis primariis terminalis, nonnunquam cum pedunculis solitariis e caulis axillis superioribus. *Umbellae* 2–4-radiatae, quot radii tot bracteis basilaribus foliaceis cinctae et involucrum floriferum solitarium ebracteatum breviter pedunculatum in centro gerentes; radii primarii validi, teretes, 2·5–5 cm. longi, ad apices in radios 2 secundarios divisi, cum involucro solitario in bifurcatione posito et infra bifurcationem bracteis 2 ovatis plus minusve connatis; radii secundarii in radios 2 tertiarios et nonnunquam radii tertiarii in radios 2 quarternarios divisi, omnes cum bracteis connatis et involucris centralibus solitariis ut supra descriptis instructi; caulis inflorescentia tota 4–20 cm. longa, 5–20 cm. lata; ramorum inflorescentiae minores; pedunculi ex axillis superioribus solitarii, umbellae radiis similes; umbellarum primariarum bracteae basilares liberae, foliis similes sed nonnihil latiores; bifurcationum bracteae foliaceae, late ovatae, semiamplexicaules vel frequentissime plus minusve connatae, 0·6–2·3 cm. longae et latae. *Involucrorum* pedunculi 1–7 mm. longi, teretes; involucra campanuliformia, circa 3 mm. longa, hyalina, extra glabra, intus glandulas adversus parcissime hirsuta; lobi 5, oblongi vel subtriangulariter elongati, sublacerati, circa 1 mm. longi, parce ciliolati; glandulae 4, late tenuiter stipitatae, extra glabrae, intus parcissime hirsutae, apice transverse elliptico circa 1 mm. in diametro transverso bicornuto leve leviter concavo, cornubus latitudinem apicalem aequantibus retusis vel bifidis, glandulae margine inter cornua subintegro vel plus minusve lobulato. *Flores* ♂ numerosi, pedicillis tenuibus elongatis parce et breviter ciliolatis cum bracteolis paucis elongatis mixtis. *Capsula* subpyramidaliter trilobata, sulcata, glabra, circa 4 mm. longa et 5 mm. lata; cocci ecarinati, rotundati; styli circa 1 mm. longi, fere ad basem liberi, breviter bifidi; stigmata transverse ovoidea, incrassata. *Semina* subgloboso-ovoidea, circa 3 mm. longa et 2 mm. lata, levia, gilvo-brunnea, versicoloria, basi truncata, peltate insculpta, apice subacuta, e ventre oblique truncata; caruncula subhyalina, irregulariter cuculliformis.

India. Gangetic Plain: United Provinces; Banda, *Mrs. Bell* 154.

Deccan: Central Provinces; Khandwa District, Baghwanpur, *Duthie* 8413; Nagpur District, Khat, *Duthie* 10,555, Tulara Hill, *Kalka Pershad* 31,611; Sururpur, *Haines* 3681.

This species has been confounded with *E. dracunculoides*, Lamk., and with *E. Rothiana*, Spreng.

Euphorbia (?**Sectio nova**) **clavidigitata,** *Gage;* a speciebus aliis indicis involucrorum segmentis glanduliferis digitatis omnino distincta.

Herba tenuis, vagans, ad 60 cm. diffusa. *Radix* tenuis, filiformis, circa 1 mm. diametro, frequenter ramosa. *Caules* pauci, filiformes, parce et dichotome ramosi, teretes, glabri, leves, circa 1–2 mm. diametro, internodiis 4–6 cm. longis, nodis leviter prominentibus, ramis paucis tenuissimis. *Folia* opposita, subsessilia, stipulata, coriacea, lineari-lanceolata, 1·5–4·5 cm. longa, 2–5 mm. lata, utrinque viridia et sub lente minute punctata, supra glabra, infra minute et parce setulose puberula, apice acuta, mucronulata, margine revoluta, scabridulose serrulata, basi inaequilateraliter subsemiauriculata; costa media in pagina superiore impressa, in pagina inferiore prominens; nervi basilares obscuri; nervi laterales in costae mediae utraque parte circa 20, brevissimi, ad marginem leviter excurvati, arborescenter ramosi et regulariter anastomosantes; nervuli ultimi caeci; stipulae interpetiolares, minutae, aculeatae. *Involucra* in cymis vel racemulis terminalibus vel axillaribus brevibus congestis parvis subcapituliformibus bracteatis disposita; cymae 0·5–1·5 cm. longae, 0·6–1·2 cm. latae; bracteae foliaceae, 1·5–5 mm. longae. *Involucra* in quaque cyma 3–8, pedicellata, turbinata; pedicelli 1 mm. longi, teretes, breviter puberuli; involucrum circa 2 mm. longum et vix 2 mm. latum, extra et intus prope fauces breviter puberulum; lobi 5, quam glandulae breviores vel glandulas aequantes, late ovati, vix 1 mm. lati, extra breviter puberuli, intus minute et parce setulosi, ciliolati, apice fimbriato-dentati; segmenta glandulifera 4, subaequalia, sepaloidea, membranacea, breviter oblonga vel oblongo-cuneata, circa 1 mm. longa, extra glabra, intus parce puberula, plus minusve in lobulos 5–7 digitiformes subaequales fissa, lobulo quocunque glandula minuta peltata coronato. *Flores* ♂ circa 20, pedicellis tenuibus teretibus glabris cum bracteolis elongatis plus minusve laceratis mixtis. *Capsula* matura pyramidaliter trigona, puberula, circa 2·5 mm. diametro; cocci subcarinati; styli tenues, fere ad basem liberi, circa 1·5 mm. longi, breviter bifidi; stigmata leviter incrassata. *Semina* subtrigono-ovoidea, vix 2 mm. longa, ecarunculata, rubro-brunnea, in ventre subexcavata, basi obtusa, apice subacuta.

Burma. Pegu Yomah, in "Eng" Forest, *Kurz* 1579; Hanthawaddy district, Lahamange, *Lace* 2900.

Cleistanthus hirsutopetalus, *Gage;* a speciebus aliis malayanis petalis extra longe hirsutis distincta.

Arbor circa 10 m. alta. *Ramuli* tenues, teretes, glabri, lenticellati, fusco-brunnei, 2–3 mm. crassi. *Foliorum* lamina anguste ovato-elliptica vel lanceolata, coriacea, 7–18 cm. longa, 3–5·5 cm. lata, apice subcaudate acuminata, margine integro, basi rotundata vel subcuneata et in costae mediae utraque parte minute

pulvinata; pagina superior sicco levi-olivacea vel brunneo-olivacea, glabra, nitida, costa media costis lateralibus et reticulatione obscuris; pagina inferior dilute olivacea; nervi laterales quam in pagina superiore minus obscuri, in costae mediae utraque parte 6–8, tenues, excurvati, intra marginem anastomosantes; petiolus subteres, glaber, transverse corrugatulus, 3–7 mm. longus; stipulae caducae, lanceolatae, circa 3 mm. longae, glabrae vel parcissime puberulae. *Glomeruli* floriferi axillares, solum flores ♂ vel flores ♀ gerentes; bracteolae ovatae vel lanceolatae extra plus minusve rufo-pubescentes et subcarinatae, intus glabrae. *Flores* ♂ non visi. *Flores* ♀ ovoidei, sessiles, 6 mm. longi; calyx extra adpresse hirsutus, intus glaber, in sepala 5 deltoidea vel lanceolata dimidiater fissus; petala 5, obovata, integra, extra longe adpresse hirsuta, intus glabra, circa 1·5 mm. longa; discus calycis partem inferiorem vestiens et annulo subconico dentato ovarii partem inferiorem cingente instructus; staminodia 5, minuta, squamiformia; ovarium subgloboso-ovoideum, hirsutum. *Capsula* pedicello valido 3 mm. longo obconice terete parce adpresse hirsuto instructa, glabra vel prope basem parce hirsuta, levis, fere nitida, levi-brunnea, 1 cm. in diametro verticale; cocci rotundati. *Semina* suborbiculari-ovoidea, 8 mm. longa, 7 mm. lata, 5 mm. crassa.

Malay Peninsula. Penang: Penara Bukit, *Curtis* 3049; Bukit Tumiary (collector unknown) 1420 (1655).

Cleistanthus praetermissus, *Gage; C. nitido,* Hook. f., affinis sed floribus glabris distinctus.

Ramuli levi-straminei, glabri, pustulati, 2–4 mm. crassi. *Lamina* elliptico-lanceolata, membranacea, 8–13 cm. longa, 3–5 cm. lata, apice longe acuminata, margine integro, basi acuta vel cuneata; pagina superior sicco fusco-olivacea, glabra, subnitida, obscure reticulata, costa et nervis lateralibus leviter impressis; pagina inferior brunnea, plus minusve glauca, in costa et nervis lateralibus plus minusve hirsuta; nervi laterales in costae utraque parte 6–8, excurvati et intra marginem anastomosantes; nervuli transversi paulum distantes et irregulares; reticulatio ultima—luce transmissa modo visa—densa, subquadrate polygonalis; petiolus tenuis, subteres, glaber, in sicco niger, dense et irregulariter corrugatulus, 5–6 mm. longus; stipulae caducae. *Glomeruli* parvi, pauci-floriferi et flores ♂ vel flores ♀ tantum gerentes, axillares vel in ramulis brevibus lateralibus spiciformibus dispositi; bracteolae minutae, ovatae, acutae vel acuminatae, extra plus minusve adpresse hirsutae et carinatae, intus glabrae. *Flores* ♂ non visi. *Flores* ♀ sessiles, ovoidei; calyx omnino glaber, in sepala 5 deltoidea vel lanceolata ad medium fissus; petala breviter unguiculata, subspatulato-obovata, subcrenulata, circa 1·5 mm. longa, glabra; dicus glaber, calycis partem inferiorem vestiens et annulo membranaceo subconico irregulariter dentato ovarii partem inferiorem cingente instructus; staminodia 5, minuta, squamiformia; ovarium subgloboso-ovoideum, hirsutum; styli basi connati, breves, subteretes, glabri, brevissime bifidi; stigmata subspatulata. *Capsula* sessilis, 8 mm. alta, 11 mm. lata, prope apicem et basem et in sulcis parce hirsuta, aliter glabra,

sicco nigra, nitida, obscure reticulata; cocci rotundati, ecarinati. *Semina*—non omnino matura—fusco- et gilvo-variegata, levia, 6 mm. longa, 5 mm. lata, 4 mm. crassa, apice subacuta, basi obtusa, excavata.

Malay Peninsula. Dinding: Gunong Tungul, *Ridley* 9440.

Phyllanthus (Reidia) filicifolius, *Gage; P. pulchro,* Wall., distanter accedit, sed habitu et sepalis dentatis haud profunde laceratis omnino distinctus.

Frutex parvus, omnino glaber. *Caulis* in specimine viso simplex, erectus, brunneus, infra teres, supra subcompressus, 1–4 mm. crassus, foliis multo reductis squamiformibus, internodiis circa 5 mm. longis. *Ramuli* solitarii vel 2–3 ex axillis, ad 4 cm. longi, circa 0·2 mm. crassi, subcompressi, brunnei, internodiis 1–3 mm. longis. *Squamae* foliaceae et stipulae in caule minutae, triangulares, scariosae; folia in ramulis bifaria, breviter petiolata; lamina inaequilateralis, oblique obovata, membranacea, 0·4–1 cm. longa, 3–6 mm. lata, apice subacuta vel breviter acuta, margine integro, basi latere altero rotundata, altero subcuneata; pagina superior sicco fusco-olivacea, obscura, sub lente leviter granulata, costa tenuissima et obscura; pagina inferior subvelutina, glauca; nervi laterales—luce transmissa tantum visi—in costae utraque parte 4–5, excurvati et intra marginem anastomosantes; reticulatio nonnihil crassa, irregulariter polygonalis; petiolus subteres, circa 0·3 mm. longus; stipulae minutae, late triangulares, acutae, membranaceae vel subscariosae, circa 0·3 mm. longae. *Flores* in ramulis axillares, pedicellati; flores ♂ in axillis inferioribus, flores ♀ in superioribus. *Flores* ♂ solitarii vel subsolitarii, e nodulis bracteolatis axillaribus orti; bracteolae minutae, sublanceolatae; pedicelli filiformes, ad 1 cm. longi; calyx in alabastro subglobosus et circa 1 mm. diametro, in flore aperto cruciformis, circa 2·5 mm. in diametro transverso, in sepala 4 subaequalia biserialia profunde fissus; sepala late obovata, membranacea, circa 1 mm. longa, leviter pulverulenta, margine apicali irregulariter et breviter dentato; sepala exteriora apiculata; glandulae 4, cum sepalis alternantes, subcarnosae, subreniformes, peltatae, circa 0·5 mm. in diametro transverso; androecii columna brevissima, antheras 2 minutas gerens; loculi antherarum subhorizontaliter divergentes. *Flores* ♀ solitarii; pedicelli quam ii floris masculi minus filiformes, rigidi, teretes, recti vel curvati, infra calycis basem leviter infundibuliformes; calyx in flore aperto circa 3·5 mm. in diametro transverso, in sepala 5–7 subinaequalia obovata membranacea subintegra plus minusve pulverulenta profunde fissus; discus breviter calyculiformis, ovarii inferiorem partem cingens, margine leviter et irregulariter incrassato; ovarium subglobose et sulcate trilobatum, circa 1 mm. in diametro transverso; styli 3, brevissimi, basi connati, profunde bifidi; stigmata erecta, divergentia, subulata. *Capsula* levi-brunnea, circa 2 mm. diametro, stylis persistentibus coronata; cocci rotundati, ecarinati. *Semina* triquetra, circa 1·6 mm. longa, rubro-brunnea, leviter granulata, dorso convexa, ecarinata, lateribus planis, apice acuto compresso, basi rotundata.

Malay Peninsula. Kedah: Langkawi, Coah, *Curtis* 2548.

XLV.—ECONOMIC NOTES—SWANSEA AND DISTRICT.

J. H. HOLLAND.

In the course of a visit to Swansea during the Museums Conference, July 6–11, 1914, the opportunity was taken to visit the Swansea Docks and also those at Bristol, Avonmouth and Cardiff. At Bristol the Museums and Art Gallery well repaid a visit; the Botany collection in the Dame Emily Smyth Room being of especial interest. Margam Park was also visited with the members of the conference on the invitation of Miss Talbot (see *K. B.* 1907, pp. 390-392). A visit was paid to several of the parks in Swansea, the principal of which are the Victoria, Cwm Donkin and Morriston.

The following plants and produce were noted in the short time at my disposal:—

"New Zealand Flax or Hemp" (*Phormium tenax*).—Two fine specimen plants in the Bamboo Garden at Margam Park. The fibre, in bales 4 feet by 3 feet 6 inches by 2 feet 6 inches, each weighing about 489 lbs., sewn loosely in "Gunny" cloth, was being landed at the Avonmouth Dock from the SS. "Buteshire" from New Zealand.

Peas (*Pisum arvense*) from New Zealand were being landed from the same ship; they are used in this country for feeding pheasants.

Bananas (*Musa sapientum*), from the West Indies. The SS. "Patia" was at the moment unloading a cargo of 65,000 bunches for Messrs. Elders and Fyffes. Each bunch was stood on the cut-end of the stalk and placed side by side in the hold consisting of three decks. They were being raised by means of elevators fore and aft, each elevator carrying about six bunches singly in cradles at a time. As each bunch reached the top it was thrown by two men, one on either side, on to a bed of straw covered with mat and immediately picked up by another man, who handed it over the side of the ship to a carrier on the wharf, who in turn handed it in to a ventilated railway van, where each bunch was arranged in the same manner as in the hold of the vessel. Tally was being taken at the entrance to each van.

Unloading was also going on through two large outlets from the hold, one fore, one aft, on to the wharf, single bunches being passed out at a time. All the bunches were quite green. Some 700 men were hard at work, and certainly this number conveyed a true impression of the "driver ant" like crowd, who from their appearance made one appreciate fully the provision that nature has provided the banana with a detachable skin.

Canadian Birch (*Betula papyrifera*).—Boards 1 inch to 4 inches; logs squared, of varying dimensions, one 18½ feet by 16½ inches square, and logs in the round up to 2 feet 6 inches in diameter had been recently discharged at King Edward Dock from ss. "Englishman" from Montreal. Birch wood is used largely in making boxes to contain tin plates, the export of which is one of the staple industries of Swansea and district. Some boxes lying in Messrs. Power, Bacon and Hough's Warehouse, South Dock, Swansea, ready for despatch to Rangoon and Calcutta were

20 inches by 14 inches and 28 inches by 20 inches, each containing 112 thin sheets of tin, and boxes 20 inches by 10 inches, somewhat deeper, contained 225 sheets of tin. At a large works at South Dock, Swansea, where these boxes are made, the size being made was 36 inches by 11 inches by $1\frac{3}{4}$ inches. The side pieces and ends from a piece examined since at Kew are of this Birch, but a piece of the wood used to form the bottom and top since examined appears to be American Sugar Maple (*Acer saccharinum*), the same wood is largely used for floor blocks. In appearance, physical characters and uses, these woods are very similar and might in the trade sometimes pass for the same. Some particulars of the Sugar Maple (*Acer saccharinum*) are given in *K. B.* 1911, pp. 303-304.

"Spruce Boards" (*Picea excelsa*), from Norway; white prepared boards from Norway; "Yellow or Pine Deal" (*Pinus* spp.) from America; "Red Pine" (*Pinus sylvestris*) from Archangel and "Oregon Pine" (*Pseudotsuga Douglasii*) from British Columbia were timbers imported to the Prince of Wales Dock, Swansea, for use by Messrs. John Lewis & Sons, timber merchants.

"Pit Props" or "Pit Wood" (*Pinus Pinaster*; *Picea excelsa*). —During the summer months immense stacks of these props may be seen in the docks near the mining centres, Swansea, Cardiff, Hull, etc. In the King's Dock, Swansea, the SS. "Torvore" was discharging 1700 tons from Bordeaux, Lisbon and Oporto. A piece out of this shipment proves it to be *Pinus Pinaster*, Soland., the largely cultivated "Cluster Pine" of the Mediterranean region. This is the Pine tree tapped for resin in the forests near Bordeaux and yields the "Bordeaux Turpentine" of commerce; many of the pieces in the consignment mentioned bore evidence of the tapping. They averaged 9 to 13 feet in length and 3 inches to 8 inches in diameter at the top and were covered with bark. Shipments of props from Bordeaux to the United Kingdom are made regularly throughout the year (Cons. Rep. Ann. No. 5319, 1914, p. 24).

In the Roath Dock, Cardiff, the SS. "Villa Garcia" had apparently just come in fully laden with the same bark-covered props, though these were said to be Spanish.

The Common Spruce (*Picea excelsa*, Link.) is also largely used for pit props, and stacks of it were seen in the King's Dock, Swansea, and in the Queen Alexandra and Roath Docks, Cardiff, where they covered many acres. The following sizes were noticed: 4 feet 6 inches, with a diameter of $3\frac{1}{2}$ inches; 5 feet, with a diameter of 6 inches, and 9 feet with a diameter of 7 inches. These props are cut into shorter lengths according to the demand from the pits. One large stack in the Roath Dock, Cardiff, containing 3305 props, was built up of eight smaller stacks, each marked on one prop with the dimensions and number of pieces in the stack as B $4\frac{1}{2}$ by $3\frac{1}{2}$—312; B $4\frac{1}{2}$ by $2\frac{1}{2}$—506, etc. Other stacks were built up in the same way of props of different dimensions and marked with another letter.

The Common Spruce is a native of the mountains of Northern and Central Europe, and the Baltic is the principal outlet for the wood. The Baltic props are distinguished from the French at the time of arrival by being clean barked. The trees are cut during the winter and the prepared wood shipped in the summer.

The large and continuous trade in this class of wood is indicated in the returns given by the Customs in "Trade of the United Kingdom" (vol. i. 1913, p. 201), the imports for 1912 being, from Russia 1,276,523 loads, value £1,920,653; Sweden, 322,344 loads, value £479,266; Norway, 111,349 loads, value £179,511; Germany, 18,554 loads, value £30,419; France, 838,450 loads, value £719,970; Portugal, 271,190 loads, value £245,384; and Spain, 80,357 loads, value £74,206. The price per English ton, f.o.b. Bordeaux, may vary from 14s. 9d. to 18s., and the freight from 4s. 6d. to 8s. per ton—4s. 6d. to 4s. 9d. per ton in 1914 are, it is reported, the lowest rates ever quoted—(Cons. Rep. l.c.). Those from the northern countries would probably be *Picea excelsa*, and from the southern *Pinus Pinaster*, although it ought to be mentioned that the "Stone" or "Umbrella" Pine (*Pinus Pinea*), of the Mediterranean region—a very similar wood to that of the last mentioned—and the Silver Fir (*Abies pectinata*) from the mountains of Central and S. Europe, are used for a similar purpose in mines.

Incidental to this subject two interesting specimens were observed, one a lichen (*Parmelia caperata*, Ach)—the "wrinkled sulphur Parmelia," frequent, especially in mountainous districts of Europe, occurring on the Himalayas, in New Zealand, and other parts of the world—on a piece of bark of a French Pit Prop (*Pinus Pinaster*), picked up from a heap lying on the deck of the SS. "Torvore," and the other, a petrified pit prop at the Royal Institution of South Wales—one of the exhibits at the reception given to the members of the Conference by the ex-President of the Institute.

Cotton seed (*Gossypium* spp.).—Many tons in bags of Uganda seed, shipped from Mombasa, May 1913, were stored, belonging to Messrs. John Robinson and Company, Limited, and the "Clan Chattan" from Calcutta had just arrived with 3000 tons of cotton seed for the same firm. By a special favour the writer was shown over their mills, and the various stages through which the cotton seed passes from the removal of the "lint" and "fuzz" to the pressing out of the oil and drying of the cake for feeding purposes were of exceptional interest. Egyptian seed is also crushed largely there.

"Cottolene," a lard-like substance, composed of cotton seed oil and Oleo-stearine from New Orleans, and Cotton Cake, Silcocks' "Lucky Star" and meal from Liverpool were stored in Messrs. Power, Bacon and Hough's Warehouse, South Dock, Swansea.

Soy Bean (*Glycine Soja*), crushed at the above mills, though nothing at the moment was being done with it. A store of cake was seen.

This bean came into prominence a few years ago, and full particulars of it are given in *K. B.*, Additional series, ix., part 2, pp. 211–214.

Manila Hemp (*Musa textilis*); bundles of "binder" twine made of this fibre stood in a warehouse, King Edward Dock, Avonmouth, recently landed from the SS. "Englishman," from Montreal; each bundle contained 10 balls, total weight about 56 lbs.

Horse Beans (*Vicia Faba*, var. *equina*); many tons in bags were

lying in an open shed on the wharf, King Edward Dock, Avonmouth. They had come, it was understood, many months before by the vessel "Yeddo," from Vladivostok.

Ground Nuts (*Arachis hypogaea*) in bags from Liverpool stored in Messrs. Power, Bacon and Hough's Warehouse at South Dock, Swansea (see *K. B.* 1901, pp. 175–200: Add. ser. ix. part 2, 1911, pp. 201–206).

Potatoes.—A small steamer, SS. "Ashton," in the West Dock, Cardiff, was at the time of passing unloading 280 tons from Pont L'Abbé, S.W. Brittany. They were loose in the hold, and were being filled into bags and baskets by men and women, weighed and loaded direct into wagons waiting near for immediate despatch to various parts of the town. These potatoes appeared to be between the quite new and the old, they could not have been handled in the same rough way, while the skins were very tender.

According to a recent Consular Report (No. 5279, 1914, p. 9) for the District of Brest, the amount of Potatoes exported from Pont l'Abbé and other Ports of Finistere—Concaneau, Loctudy, and Roscoff—to the United Kingdom in 1913, is given at 12,853 tons, value £47,218.

XLVI.—DIAGNOSES AFRICANAE: LX.

1511. **Leptoderris aurantiaca,** *Dunn* [Leguminosae-Dalbergieae]; *L. calvae,* Dunn, affinis, paniculae rhachi velutina, stipulisque infra insertionem productis distincta.

Frutex erectus vel scandens, praeter inflorescentiam glaber, cortice laevi striato. *Folia* 4-juga, 30–40 cm. longa, petiolo 5-plo longiora; stipulae lanceolatae, paullo supra basin affixae, 2 cm. longae; foliola superiora lateralia obovata, breviter acuminata, ad basin attenuata, obtusa, 9–11 cm. longa, chartacea; nervi marginem propinquantes 8–9-pares, infra prominentes, supra impressi; petioli 5 mm. longi; stipellae setaceae, 2 mm. longae. *Paniculae* axillares et terminales, 20–50 cm. longae, a basi ramosae, rhachi ramisque longis dense velutinis; nodi floriferi 1–2 mm. longi; rhaches ramorum bracteis magnis pubescentibus tarde deciduis suffultae. *Flores* conferti, 6–7 mm. longi; pedicelli 1 mm. longi. *Calyx* tubularis, 2·5 mm. longus, laxe sericeus. *Petala* glabra; vexilli lamina ovata, ad basin angustata; alae oblongae, basi hamatae; carinae petala ovata, apice acuta, basi truncata. *Stamina* praeter vexillare basi solutum connata. *Ovarium* medio biovulatum. *Legumen* oblongo-lineare, apice basique obtusum, 10–13 cm. longum, 3–4 cm. latum, glabrum, indehiscens, papyraceum, uno latere alatum, reticulatum. *Semina* 1–2, disciformia; cotyledones cordatae.

Tropical Africa. French Congo, *Klaine* 67, 655, 1172.

1512. **Leptoderris cyclocarpa,** *Dunn* [Leguminosae-Dalbergieae]; *L. aurantiacae,* Dunn, foliis affinis sed ab ea omnibusque speciebus hujus generis quarum fructus noti sunt leguminibus distincta.

Frutex scandens, praeter inflorescentiam glaber, ramulis rugosis griseis. *Folia* 2-juga, 20–30 cm. longa, petiolis 4-plo

longiora, stipulis deciduis; foliola superiora lateralia obovata, apice rotundata vel obtuse acuminata, apiculata, 8–12 cm. longa, chartacea, supra nitentia, subtus opaca, reticulata; nervi marginem propinquantes, 6–7–pares, infra prominentes; petioluli 3–4 mm. longi; stipellae setaceae, 3 mm. longae. *Paniculae* axillares, ad 12 cm. longae; rhachis breviter et tenuiter ferruginea; ramuli floriferi fere ad basin rhachis simplicis producti, 13 mm. longi, ferruginei. *Flores* dense conferti, 11 mm. longi; pedicelli 1 mm. longi. *Calyx* campanulatus, 4 mm. longus, dense sericeus, dentibus tubo 5-plo brevioribus, late triangularibus; bracteolae ovatae, calcyce bis breviores. *Petala* glabra, lutea; vexilli lamina oblongo-ovata, basi paullo plicata, rotundata; alae basi hamatae, lineari-oblongae; carinae petala similia. *Stamina* monadelpha. *Ovarium* medio biovulatum. *Legumen* disciforme, 3 cm. diametro, 5 mm. crassum, anguste alatum. *Semen* unicum, 2·5 cm. diametro; cotyledones cordatae.

Tropical Africa. French Guinea: Ditinn, *Chevalier* 13,578.

1513. **Leptoderris velutina,** *Dunn* [Leguminosae-Dalbergieae]; *L. reticulatae*, Dunn, affinis, paniculae ramis brevibus divaricatis et foliolis paniculisque saepe multo majoribus distincta.

Frutex scandens, ramulis dense velutinis. *Folia* 3-juga, 30–40 cm. longa, rhachi ut ramulis vestita; stipulae persistentes, 4 mm. longae, 5 mm. latae, velutinae; foliola superiora lateralia margine revoluta, oblongo-obovata, 10–13 cm. longa, 5 cm. lata, coriacea, supra glabra, nitentia, subtus dense breviter tomentosa; venae marginem proximantes, 6–pares, venulis subtus reticulatis; petioli 5 mm. longi; stipellae 3–4 mm. longae. *Paniculae* a medio ad apicem divaricate ramosae, terminales, 20 40 cm. longae; rhachis ut ramuli vestita; nodi floriferi 2–3 mm. longi. *Flores* conferti, 1·1 cm. longi; pedicelli 1–2 mm. longi. *Calyx* tubulosus, 4 mm. longus, velutinus. *Petala* glabra; vexilli lamina anguste oblonga, cordata, marginibus involutis; alae lineari-oblongae, basi hamatae; carinae petala oblonga. *Stamina* monadelpha, vexillari basi soluto. *Discus* glandulosus. *Ovarium* multiovulatum. *Legumen* papyraceum, oblongum, 9 cm. longum, 2·5 cm. latum, uno latere anguste alatum, reticulatum. *Semina* 1–2.

Tropical Africa. French Congo: Libreville, *Klaine* 71,636.

1514. **Crassula** (**Eucrassula**) **pectinata,** *Conrath* [Crassulaceae]; affinis *C. Turritae*, Thunb., a qua foliis radicalibus breviter ovatis obtusis, caulis indumento, petalis longiuscule cuspidatis differt.

Caulis rigide erectus, simplex, 2–4·5 dm. altus, pilis crassiusculis obtusis patentibus breviter dense pubescens. *Folia* radicalia conferto-rosulata, ovata vel orbiculari-ovata, obtusa vel rotundata, usque ad 4 cm. longa, 3 cm. lata, utrinque glabra, setulis crassiusculis acutis pellucidis pectinato-ciliata; folia caulina opposita, sessilia, libera, suberecta, ovata vel oblongo-ovata, obtusa, pectinato-ciliata, ceterum glabra, internodiis circiter 2·5 cm. longis paullo longiora vel breviora. *Inflorescentia* thyrsoidea, spiciformis, e verticillastris superpositis circiter 15 caulis versus apicem valde approximatis constans, paribus duobus inferioribus bractearum thyrsos circiter 3 cm. longos

suffulcientibus; bracteae foliis caulinis similes, sed magis triangulari-ovatae, multo minores, cymis breviores, acutiusculae, extra minute dense pubescentes, pectinato-ciliatae; verticillastri fasciculiformes, ut thyrsi breviter pedunculati, intermedii 1 cm. inter se distantes, circiter 1·5 cm. diametro; bracteolae triangulari-lanceolatae; pedicelli circiter 2·5 mm. longi, glabri. *Calycis* segmenta oblonga, acutiuscula, circiter 2·5 mm. longa, dorso marginibusque pilis brevibus sparse induta. *Petala* basi connata, oblongo-elliptica, 3 mm. longa, trinervia, cuspidata, cuspide subulato-conico aspero antherae subaequilongo. *Stamina* circiter 2·5 mm. longa; filamenta plana, late linearia, infra antheras abrupte contracta. *Folliculi* oblongi, parum obliqui, 1·5 mm. longi, stigmate brevi.

South Africa. Transvaal: Modderfontein, *Conrath* 287.

1515. **Kalanchoe Pearsonii,** *N. E. Brown* [Crassulaceae]; similis *K. multiflorae*, Schinz, sed bracteis et floribus majoribus, calyce tubo corollae aequilongo conspicue differt.

Herba succulenta, circa 60 cm. alta, omnino glabra. *Caulis* basi 8 mm. crassus, teres vel vix angulatus. *Folia* opposita, sessilia, inferiora 10–12·5 cm. longa, 1–2 cm. lata, superiora gradatim minora, anguste oblongo-linearia, obtusa vel subacuta, integra. *Cymae* corymbosae, compactae, ad 10 cm. latae, ramis suberectis. *Bracteae* 1–2·5 cm. longae, 1·5–3 mm. latae, lineares, acutae. *Pedicelli* 0·8–1·5 cm. longi. *Sepala* libera, 1–1·2 cm. longa, 2–3 mm. lata, linearia, acuta. *Corollae* tubus 0·9–1·1 cm. longus, suburceolatus, 4-angularis; lobi 6 mm longi, 2·5 mm. lati, acuti, lutei.

Tropical Africa. South Angola: fairly common on the Huilla Plateau, near Humpata, 2000 m., *Pearson* 2149.

1516. **Mussaenda odorata,** *Hutchinson* [Rubiaceae-Mussaendeae]; affinis *M. Holstii*, Wernham, sed foliorum nervis subtus subdense pubescentibus, corollae tubo latiore brevioreque lobis longe acuminatis differt.

Arbor riparia, parva, usque ad 6 m. alta; ramuli teretes, prominenter lenticellati, breviter adpresse pubescentes; internodii 1·5–4 cm. longi. *Folia* elliptica vel obovato-elliptica, acute acuminata, basi cuneata, 12–17 cm. longa, 6–10 cm. lata, membranacea vel subchartacea, supra parce setuloso-pubescentia, infra in nervis venisque dense patente pubescentia; nervi laterales utrinque 10–15, arcuati, inferne subopposite, venis laxis gracilibus; petioli 1·5–2 cm. longi, leviter compressi, rufo-puberuli; stipulae caducae, non visae. *Cymae* laxe ramosae, circiter 20 cm. diametro; bracteae lineari-lanceolatae, acutae, usque ad 1·3 cm. longae, extra adpresse pubescentes. *Receptaculum* campanulato-globosum, tomentosum. *Calycis* segmenta subulato-linearia, acutissima, 1 cm. longa, extra adpresse pubescentia, uno saepe in laminam petaliferam albam late ovatam obtuse acuminatam 8–9 cm. longam 5–7 cm. latam puberulam producto. *Corollae* tubus cylindricus, 2·5 cm. longus, 3 mm. diametro, infra superne dense flavo-villosus, extra adpresse tomentosus; lobi 5, ovati, longe caudato-acuminati, circiter 8 mm. longi, 4–5 mm. lati, puberuli. *Stamina* in corollae tubi medio

inserta; antherae 4 mm. longae. *Stylus* gracilis, 2 cm. longus, glaber, trilobatus, lobis lanceolatis obtusis 3–4 mm. longis. *Fructus* subglobosus, circiter 1 cm. diametro, puberulus.

Tropical Africa. British East Africa: streams of South-East Kenya, 1835–1990 m., *Battiscombe* 708.

Mr. Battiscombe states that the flower is sweet scented, and that the petaloid sepals give the tree the appearance of a white *Poinsettia*.

1517. **Landtia lobulata,** *Hutchinson* [Compositae-Arctotideae]; affinis *L. Ruppellii*, Benth., sed foliis basi lobulatis crassioribus bullatis differt.

Herba patula, parva, subaculis; rhizoma crassum, fibrosum, radicibus elongatis teretibus crassis. *Folia* radicalia, petiolata, basi pinnatim bilobulata, superne ovata, crasse sinuato-dentata, obtusa, 2–3·5 cm. longa, 2–2·5 cm. lata, rigide coriacea, bullata, supra viridia, glabra, infra cano-tomentosa, nervis lateralibus utrinque 4–5 infra prominulis; petioli usque ad 3 cm. longi, robusti, subglabri. *Capitula* pedunculata, circiter 2 cm. expansa; pedunculus crassus, 1–1·5 cm. longus, dense lanatus. *Involucri* bracteae 4–seriatae, exterioribus lanceolatis acute acuminatis extra pubescentibus, interioribus oblongis apice rotundatis membranaceis glabris. *Flores* radii 2 cm. longi; corolla glabra; tubus 3 mm. longus; ligula minute tridentata. *Flores* disci 0·8 cm. longi; corollae tubus glaber, inferne cylindricus, superne anguste campanulatus, lobis 5 lineari-lanceolatis apice cucullatis. *Achaenia* subcylindrica, 2 mm. longa, glabra. *Pappus* vix 1 mm. longus, argenteus.

Tropical Africa. British East Africa: upper slopes of Kinangop Mountains, 3000–4000 m., *Galpin* 7918.

1518. **Brachystelma linearifolium,** *Turrill* [Asclepiadaceae-Ceropegieae]; *B. longifolio*, N. E. Brown, affinis, sed floribus majoribus facile distinguendum.

Herba perennis; rhizoma tuberosum, 5 cm. diametro; caulis erectus, inferne ramosus, teres, 12 cm. altus, minute puberulus, purpureo-viridis. *Folia* numerosa, linearia, acuta, basi leviter angustata, usque ad 8 cm. longa et 5 mm. lata, costa pagina inferiore prominente, superiore canaliculata, nervis lateralibus pagina utraque obscuris, margine et costa subtus scabriusculis exceptis glabra. *Inflorescentia* uniflora, axillaris; pedicellus 1·5 cm. longus, minute puberulus, purpureo-viridis. *Calycis* lobi 5, lineari-lanceolati, acutissimi, 4 mm. longi, basi 1 mm. lati, extra leviter puberuli. *Corollae* purpureae tubus brevissimus; lobi patentes, liberi, lineari-oblongi, replicati, apice acuti, 2·1 cm. longi, 4 mm. lati, margine minute ciliati, intus purpurei, extra viridi-purpurei. *Corona* biseriata; exterior e lobis 5 alte bifidis 3 mm. longis patentibus inferne pilis albis reversis instructis purpureis constituta; interior e lobis conniventibus 1 mm. longis ventricosis obtusis purpureis constituta. *Staminum* columna circiter 1·5 mm. alta, flava. *Carpella* (stigmate excluso) 2 mm. alta, 0·75 mm. diametro, viridia, glabra.

Tropical Africa. Rhodesia, *Hislop*.

Described from a plant grown at Kew and flowering in July of the current year (1914).

1519. **Huernia transvaalensis,** *Stent* [Asclepiadaceae-Stapelieae]; affinis *H. guttatae*, R. Br., sed corollae tubo intus pilis purpureis ornato, lobis atropurpureis basi flavo-lineatis et coronae interioris lobis apice recurvis differt.

Herba succulenta, nana, aphylla. *Rami* 4–6 cm. longi, dentibus exclusis 1·5–1·8 cm. crassi, 4–5-angulati, glabri, angulis dentibus deltoideis acutis 4–7 mm. longis armatis. *Flores* 1–3, e basi caulium enati. *Pedicelli* 1·2–1·8 cm. longi, glabri. *Sepala* 1–1·4 cm. longa, subulato-attenuata, glabra. *Corolla* 4–5 cm. diametro, extra glabra, purpureo-tincta, ore tubi pilis longis purpureis papillis enatis intus ornato, cetera glabra; tubus 7–8 mm. longus ore 6–7 mm. diametro, campanulatus, pallidus; limbus e tubo horizontaliter patulus; discus in annulum pulviniformem elevatus, atropurpureus, nitidissimus; lobi subpatuli 1·5 cm. longi et lati, deltoidei, acuminati, rubro-purpurei, basi irregulariter pallide luteo-notati. *Coronae* exterioris lobi 2 mm. longi, 3 mm. lati, transversim rectanguli, breviter et obtuse bifidi, lutescentes, purpureo-marginati; interioris lobi 3 mm. longi, subulati, acuti, basi erecti, superne recurvi, purpurei.

South Africa. Transvaal: Crocodile Poort, in the Magaliesberg Range, *I. B. Pole Evans*, Aug. 24, 1913.

The photographs (plate facing p. 250), were taken by Mr. Pole Evans of the plant growing in the garden attached to the Laboratory of the Department of Agriculture at Pretoria, where it had been flowering profusely from December to April. It was found in sandy places among rocks on the Magaliesberg Range.

The light coloured ring on the disk of the corolla is not due to colouration but is caused by the reflection of light from the very shining blackish purple surface of that part.

1520. **Bridelia Schlechteri,** *Hutchinson* [Euphorbiaceae-Phyllantheae]: affinis *B. tenuifoliae*, Muell. Arg., foliis angustioribus infra glaucis nervis lateralibus vix ramosis differt.

Rami graciles, lenticellis prominentibus instructi; ramuli juniores elongati, nodis leviter pubescentibus. *Folia* oblongo-oblanceolata, subacuta, basi leviter attenuata vel rotundata, 2·5 6 cm. longa, 1·3–3 cm. lata, chartacea, utrinque glabra, infra glauca; nervi laterales ad marginem elongati, arcuati, gracillimi, utrinque distincti; nervi tertiarii paralleli, graciles; petioli 2·5 3 cm. longi, nigri, verrucosi, paullo pubescentes; stipulae subcaducae, subulato-lanceolatae, acuminatae, 4 mm. longae, pubescentes. *Flores* ♂ breviter pedicellati. *Sepala* ovata, obtusa, circiter 2 mm. longa, 1 mm. lata, glabra. *Petala* suborbicularia, 1 mm. longa, carnosa, apice obscure denticulata. *Discus* orbicularis, planus, carnosus. *Columna* staminalis gracilis, 1·5 mm. longa; antherae parvae. *Ovarii* rudimentum plus minusve subulatum. *Flores* ♀ subsessiles, basi pubescentes: *Sepala* et petala ut in floribus ♂. *Discus* glaber. *Ovarium* ellipsoideum, laeve; styli 2, ad basin liberi, profunde bilobi. *Fructus* immaturus ellipsoideus, 2-locularis.

Tropical Africa. Portuguese E. Africa: Beira, *Rogers* 4551. S. Africa. Portuguese E. Africa: Inyamasan, *Schlechter* 12065

XLVII.—ENCEPHALARTOS WOODII.

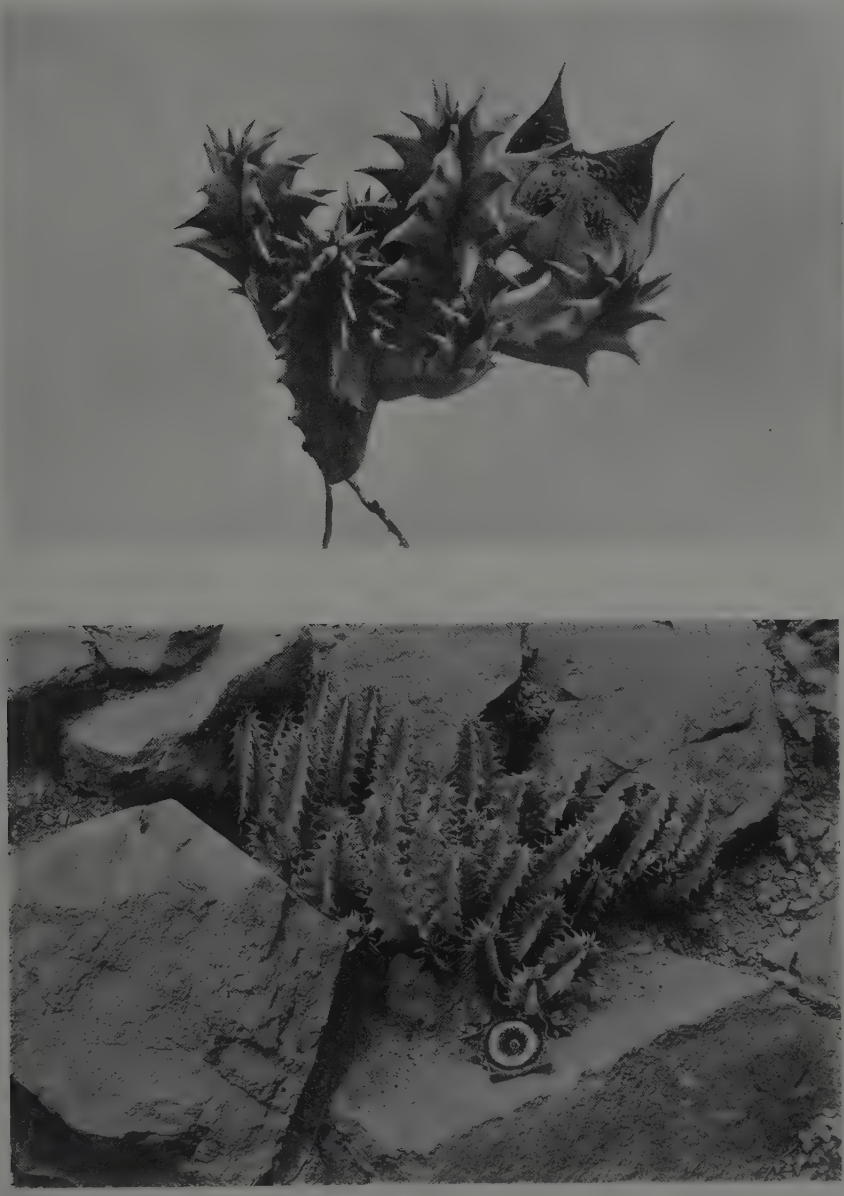
(WITH PLATE.)

In the Annual Report on the Natal Botanic Gardens and Colonial Herbarium for the year 1906-07, p. 8, Mr. (now Dr.) J. Medley Wood, the Director, gave a brief account and a photograph of a "rare variety of *Encephalartos*" which had been discovered by him in Zululand a few years previously. Some living plants of the same species were collected in 1903 and again in 1907 by Mr. Wylie, the Curator of the Gardens. These were then planted in the Natal Gardens, and a leaf from one of the plants was forwarded to Kew, and provisionally determined as *Encephalartos Altensteinii*, Lehm., var. *bispinosa*, and the photograph in the report bore this name.

In an account of the new plants exhibited by Messrs. Sander and Sons, of St. Albans and Bruges, at the centenary exhibition of the Ghent Botanical and Horticultural Society, published in the Gardeners' Chronicle for 1908, lxiii. p. 257, the same species was described as *Encephalartos Woodii*, Hort. Sand. It was pointed out that for garden purposes, at any rate, the plant was as distinct from the variable *E. Altensteinii* as the other recognised species of the genus were from one another. The largest plant shown at the exhibition had a stem 18 ins. high and 8 ins. in diameter, with a handsome head of 25 leaves, which attained 5 ft. in length. The leaves were gracefully curved and furnished with leaflets of variable size, the largest being 8 ins. long and 2 ins. wide, arranged about 4 ins. apart in the lower portion of the rhachis, and more closely towards the apex, where they overlapped. The broadest leaflets were irregularly pinnatifid, the principal divisions and apex being spine-tipped. It was stated that the texture and bright shining green of the large leaves easily distinguished the plants from all other species of *Encephalartos*. It was said to grow well under cultivation, and to be a strikingly handsome plant.

In the same volume of the Gardeners' Chronicle, p. 414, Mr. Medley Wood gave a more detailed account of the discovery of the species, which we take the liberty of reprinting here:—

"In the year 1895 I was on a botanical collecting trip with wagon and oxen in Zululand, and having reached a spot where the country was very rough I stayed for several days botanising in the vicinity, and in so doing found a solitary clump of *Encephalartos*, consisting of four stems, the tallest of which was about 18 ft. high, with proportionate girth of stem, and with a few offsets at the base; the stems were all male, and not another plant of the species could be found in the vicinity, though we found a number of plants of *E. brachyphyllus*, of which we took away a number of specimens. Some years afterwards our Curator, Mr. J. Wylie, visited the locality, and I directed him to the place where these *Encephalartos* were. He brought back with him several of the smaller plants of the group, three of which were planted here, and in my report for 1906-7 I gave a photograph of one of them, with a very short note as to the habitat of the species. We have in the garden seven species of *Encephalartos*, and numerous



HUERNIA TRANSVAALENSIS.

[*To face page* 250.

ENCEPHALARTOS WOODII.

To face page 251.]

specimens, but these three, as far as the foliage is concerned, are, in my opinion, not only the handsomest of all, but are strikingly different from any of the others, and I regret very much that such fine specimens as I saw should have been wantonly destroyed by the natives. I may conclude by saying that we have in the garden a plant, of which I believe there is a photograph in the Museum at Kew. It has been known as the 'Giant Encephalartos.' This plant is a male, and this year has no less than 18 cones, arranged in more or fewer complete concentric circles. I think that this is a record number; the trunk has been partly buried in the side of an embankment, and it is intended to remove it to a position where its full length can be seen to better advantage."

Quite recently Dr. Medley Wood has kindly forwarded to Kew a photograph of one of the two plants collected by Mr. Wylie in 1907, which we reproduce here. Dr. Medley Wood informs us that some of the examples grown in the Durban Gardens have now stems as high as 15 ft. or more, but as yet none of them have produced cones. Until these are forthcoming an adequate description is not possible.

The photograph of one of the plants in the Durban Gardens, here reproduced, was taken by Mr. W. D. Haygarth, and is of particular interest as it gives us also an excellent portrait of Dr. Medley Wood, whose sustained and untiring labours have done so much to increase our knowledge of the Flora of Natal.

XLVIII.—A NEW TROPICAL AFRICAN SARCOPHYTE.

J. HUTCHINSON.

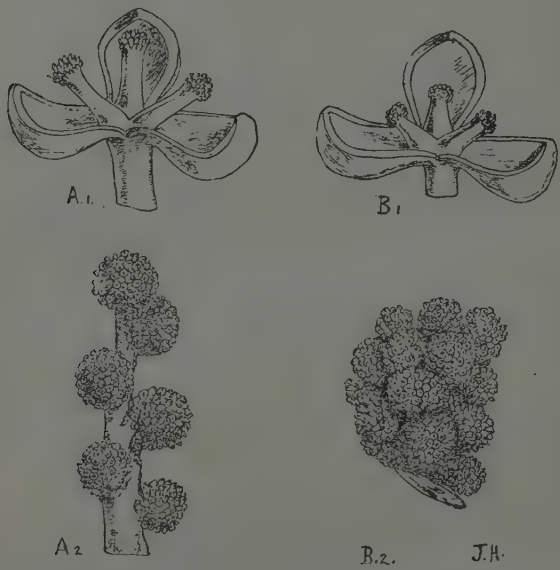
In the Flora of Tropical Africa vol. vi. i. p. 436, Hemsley expressed doubt as to whether the Tropical East African specimens of *Sarcophyte* (*Balanophoraceae*) referred by Engler to *S. sanguinea*, Sparrm., really belonged to that species, which was previously known to occur only in the neighbourhood of Grahamstown, South Africa. Hemsley observed that the Cape plant appeared to have a much more compoundly branched male inflorescence, but the material at his disposal was insufficient to decide the question and he had no alternative but to accept Engler's determination.

Thanks to the efforts of Mr. E. Battiscombe, Conservator of Forests, British East Africa, Kew has now received ample material, both male and female, of the East African plant, and the examination of these specimens and a photograph of them growing in their native habitat proves that they represent quite a distinct species. The collector of the new material is Dr. J. H. H. Pirie of the East African Medical Staff, after whom we have pleasure in naming the species. A second supply of specimens and a photograph were obtained by Mr. McGregor Ross, Director of Public Works, British East Africa.

Besides the difference in the branching of the male inflorescence observed by Hemsley, several other differences have been found

in both sexes which appear to be quite constant. These are shown in the following diagnoses of the two species:—

S. sanguinea, *Sparrm.* Male inflorescence compound, *i.e.*, the primary branches with short lateral branchlets bearing several flowers; bracts ovate or lanceolate-ovate; flowers mostly in pairs and fairly long-pedicellate, with the pedicels connate in their lower part; stamens from $\frac{3}{4}$ as long to nearly as long as the perianth segments (fig. A 1). Female inflorescence with the clusters of flowers loosely arranged and often shortly stalked (fig. A 2); diameter of the discoid stigma as great or nearly as great as that of the ovary, the latter being often completely hidden.—South Africa.



A. 1, Male flower of *Sarcophyte sanguinea*, × 4; A. 2, Branch of female inflorescence of same, nat. size; B. 1, Male flower of *S. Piriei*, × 4; B. 2, Branch of female inflorescence of same, nat. size. A. 1, after Hooker, remainder original.

S. Piriei, *Hutchinson,* sp. nov. Male inflorescence simply branched; bracts oblong or linear-oblong; flowers solitary, very shortly and stoutly pedicellate, or if in pairs then the pedicels not connate; stamens less than half as long as the perianth-segments (fig. B 1). Female inflorescence with the clusters of flowers sessile and densely crowded on the lateral branches (fig. B 2); diameter of the discoid stigma much less than that of the ovary, the latter always plainly visible.—British and German East Africa.

The relative length of the stamens and perianth-segments in

the male flowers appears to be the most important distinguishing character for the separation of the male plants of the two species, and the females may be readily recognised by the nature of the inflorescence. Even when quite young the heads of female flowers of *S. sanguinea* are laxly arranged and often shortly stalked on the lateral branches, and for a considerable time the discoid stigmas are closely pressed together and completely hide the ovaries beneath. Another character which may be of some importance is the presence of numerous bracts at the base of the male axis in *S. sanguinea*. There are none on the East African specimens and they are not visible on the photograph. In addition to the above differences *S. Piriei*, according to Mr. Battiscombe, is quite odourless, whereas *S. sanguinea* is described as possessing a particularly obnoxious smell.

S. Piriei, *Hutchinson*, sp. nov. *Planta* omnino glabra, inodora. *Tuber* irregulariter lobatum, verrucosum, magnum. *Inflorescentia* ♂ usque ad 23 cm. longa et 10 cm. diametro, ambitu cylindrica; axis simpliciter ramosus, carnosus; rami dense dispositi, ascendentes, ad 4·5 cm. longi, floribus inclusis circiter 2 cm. diametro; bracteae oblongae vel lineari-oblongae, obtusae, 1·5–2 cm. longae, 0·6–1 cm. latae, chartaceae vel subcoriaceae. *Flores* ♂ solitarii vel geminati; pedicelli crassi, 2–3 mm. longi. *Perianthii* segmenta plerumque 3, rarius 2 vel 4, obovata, apice obtusa et cucullata, 4–5 mm. longa, 3–3·5 mm. lata, carnosa. *Stamina* perianthii segmentis vix dimidio brevioria. *Inflorescentia* ♀ ambitu subglobosa, circiter 12 cm. diametro; axis brevis, crassus; rami densissime dispositi, breves; capitula sessilia, globosa, in quoque ramo circiter 10 disposita. *Flores* numerosi; ovarium in receptaculo immersum; stigma sessile, discoideum, ovarii latitudine dimidio angustius.—*S. sanguinea*, Engl. Pflanzenw. Ost-Afr. C 168; Hemsl. in Dyer Fl. Trop. Afr. vi. i. 436, excl. descr. of ♀ inflorescence, references and synonym, not of Sparrm.

Tropical Africa. British East Africa: Kibwesi, damp low forest at about 1010 m., on the roots of a thorn tree, *Scheffler* 361, ♂; *Scott Elliot* 6293, ♂; by the side of a stream on the Ngongo Bagas Hills near Nairobi, at about 1835 m., *Pirie in Herb. Battiscombe* 815, ♂; on the roots of an Acacia at the south end of the Ngongo Hills, about 1850 m., *McGregor Ross*, ♂ and ♀. Teita Hills, *ex Engler*. German East Africa: Ukami near Pangani, *ex Engler*.

XLIX.—NIGERIAN FUNGI: II.

E. M. Wakefield.

A small but very interesting collection of fungi has been received from Mr. C. O. Farquharson, Government Mycologist in the Nigerian Department of Agriculture. Mr. Farquharson has supplied notes as to the habitat of the fungi and other particulars with the specimens, and has also contributed the following remarks relating to ecological conditions.

"The collection has been made, roughly speaking, in three types

of country representing (1) Tropical Rain Forest, as found in the Government Forest Reserve at Ilugboro, (2) Tree Savannah or bush forest as found in the neighbourhood of Ibadan, and (3) Bush Savannah merging into tall grass savannah as found on the great plateau between Abeokuta and Meko, and its boundaries.

"In my journey through the Meko district, from Abeokuta to the town of Meko and from there south and eastwards through Aiyetoro, Ilaro, Ifo, Otta, and Agege, practically all these conditions were encountered. On a short tour through this district it is hardly possible to say that any particular types characterise the different formations, but what struck me especially about the high rain-forest country was the great scarcity of large fungi. From the humid conditions I was led to expect better things in this respect. Most of the forms appeared to be small and extremely delicate Agarics, *Polyporeae* like *Laschia*, a species closely resembling *L. lateritia* being not uncommon, and one or two *Phallinae* (*Dictyophora* sp. and *Phallus* sp.). . . .

"Even on trees which have been felled by the natives in making bush paths through the rain-forest, the forms encountered were few and not very interesting.

"*Polystictus xanthopus*, Fr. and *P. incomptus*, Fr. seem very tolerant of these conditions. The large *Fomes* with brown hymenium (*Fomes yucatanensis*, Murr.) was found in the Forest Reserve at Ilugboro, in two instances suggesting parasitism on their bush host. The gatherings sent are rather small, but specimens a foot or more across were observed. . . . No. 31 (*Polyporus Colossus*, Fr.) is found on the outskirts of high forest at Agege, but has been found also in great profusion in the more distinctly upland conditions at Ibadan, on decaying stumps of the Oil Palm.

"Of the Hexagonias collected, *H. discopoda* seems to be common in sub-rain-forest conditions. . . .

"The deep-pored Hexagonias were all found under bush savannah conditions on dead branches of small trees. How far this corresponds to their normal habitat I cannot say, as they are not sufficiently common. In the Meko-Aiyetoro district the rainfall probably would not greatly exceed thirty inches, and the short tornado season which marks the beginning and the end of the rains would account for a considerable proportion of the total. . . .

"On the decaying logs in farm clearings in the sub-rain-forest conditions such as obtain in the Cacao-growing districts certain forms are extremely common, notably *Polystictus cinnabarinus*, Fr., *P. Persoonii*, Fr., *P. occidentalis*, Kl., *Polyporus gilvus*, *Fomes lucidus*, *Schizophyllum commune*, Fr., *Polyporus lignosus*, Kl., the Para Rubber root disease, *Hymenochaete noxia*, Berk., of which small fructifications are not uncommon, and among the Ascomycetes *Daldinia concentrica*, Ces. et De Not., and various *Xylariae*. Under such conditions, too, in the wet season, there is a fairly extensive flora of Myxomycetes. Large ground *Pezizineae* seem to be very uncommon. The number of Agarics appears to be very few compared with what may be seen in Britain in localities that appear far less promising."

The following list includes specimens collected in the southern

Provinces of Nigeria by Mr. Farquharson, together with a few sent at various times by other correspondents and preserved in the Kew Herbarium. Some of the species were recorded previously (*K. B.* 1912, p. 141)—but additional notes or more correct nomenclature are now given.

AGARICACEAE.

Lentinus Tuber-regium, *Fr.* Epicr., p. 392.

L. Woermanni, Cohn and Schroeter, in Abhandl. Naturw. Verein Hamburg xi. p. 4.

L. flavidus, Mass. in *Kew Bull.* 1901, p. 163.

A full description of this fungus, and its synonymy, has been given by Ramsbottom in the British Museum "Catalogue of Plants collected by Mr. and Mrs. P. A. Talbot in South Nigeria." The following additional notes, supplied by Mr. T. D. Maitland, formerly Curator in the Agricultural Department, as to the use of the sclerotium by natives, are of interest:—"The Ibo name is *Osu,* pronounced '*aw-so.*'" The Yoruba name is *Olú,* which simply means "mushroom," and is applied to several species of fungi. The sclerotia appear to be common in the bush, and most of the natives are familiar with them, and use them as food. They collect the *Olú* in the bush and bring it to the farm where they bury it in the ground. When required for use sufficient is cut off for immediate needs. They are also said to be able to cultivate it in this way, as small sclerotia brought from the bush readily grow and may attain the size of a football.

"To prepare the sclerotium for food it is first washed, then scraped into powder and boiled in soup along with fowl, fish, or other animal food.

"In Ogwashi, in the Central Province, the natives grind the sclerotia into powder, and mix it with the dye from Anatto seeds (*Bixa orellana*), making a paste of the compound with which they paint their bodies."

POLYPORACEAE.

Polyporus arcularius, (*Batsch*) *Fr.* Syst. Myc. i. p. 342.

Boletus arcularius, Batsch. Elench. Fung., p. 97.

A rather pale form. Similar specimens have been received from Sierra Leone. Agege. *T. D. Maitland* (1913).

Polyporus gilvus, (*Schw.*) *Fr.* Elench., p. 104.

Boletus gilvus, Schw. Syn. Fung. Car. Sup., p. 70.

Exceedingly common on decaying tree-stumps, both in upland bush forest and (more especially) in high forest. The species is very variable in habit, and sometimes tends to become perennial. *Farquharson* 10.

Polyporus Colossus, *Fr.* Nov. Symb., p. 56.

Ganoderma obockense, Pat. in Bull. Soc. Mys. Fr. iii. 1887, p. 119.

Polyporus Hollandii, Mass. in *Kew Bull.* 1901, p. 163.

A good series of entire specimens is sent. The species is a fairly common saprophyte in farm clearings in moist districts, but has been found in great profusion on felled Oil Palms at Ibadan.

It also occurs on Dicotyledonous trees. It grows out first as a great cushion of tissue, creamy-white in colour, gradually becoming bracket-shaped. The margin is sterile, thick, and white at first. The pores open rather late. When untouched the surface of the hymenium is white, but is easily bruised, and turns dark-greyish. When mature it sheds an enormous quantity of spores, which cover logs or grass beneath the fructifications with a brown coat. When fresh the fungus is almost spongy in texture, very moist and extremely difficult to dry satisfactorily.

Ibadan. *Farquharson* 31. A specimen has also been received from Sierra Leone.

Fomes lignosus, (*Kl.*) *Bres.* in Hedwigia 53, 1913, p. 60.

Polyporus lignosus, Kl. in Linnaea viii, 1833, p. 485.

Fomes semitostus, Auctt. (non Berk.).

Polyporus Auberianus, Mont. in Ramon de la Sagra, Hist. de l'Ile de Cuba, p. 399, tab. xvi. fig. 1.

The specimens show the great variability in habit of this species, from entirely resupinate forms to the thick perennial fruit bodies of a typical *Fomes.* One of the specimens was found on the Oil Palm (*Elaeis guineensis*); Petch states that it does not occur on Palms or Bamboos in Ceylon,* but it may be noted in this connection that it has been received from Singapore growing on Bamboos, and has also been recorded on monocotyledons in the Federated Malay States.

Fomes yucatanensis, (*Murr.*) *Sacc.* et *D. Sacc.* Syll. Fung. xvii. p. 116.

Pyropolyporus yucatanensis, Murr. in Bull. Torr. Bot. Club, xxx. 1903, p. 119.

Xanthochrous rudis, Pat. in Bull. Soc. Myc. Fr. xxiii. 1907, p. 83.

Polyporus rudis (Pat.) Sacc. et Trott. Syll. Fung. xxi. p. 269. Pileus of varying size, from 4 inches to a foot or more wide, and up to 8 or 9 ins. across, applanate or sometimes more or less triangular in section, but never truly ungulate. Surface covered with a horny crust, at first deep umber-brown, velvety pubescent, deeply concentrically furrowed, later becoming blackish, rough, and cracked. Margin paler, obtuse. Flesh radiating, colour of flesh and tubes "antique brown" (Ridgway 17 O.Y., k). Pores minute, deep brown. Spores brown, subglobose or elliptical, 5 × 4–4·5 μ. Setae usually present, abundant, 5 μ diameter, projecting 12–15 μ. Two specimens of this collection show no setae, while possessing abundant spores. These may possibly be conidial forms. The species is close to *Fomes rimosus,* but is distinguished by the much more yellow-brown colour of the flesh, the velvety surface, and the presence of setae in the pores.

In moist, high forest, growing at the base of trees, and possibly parasitic. Meko-Aiyetoro. *Farquharson* 28.

Fomes pachyphloeus, *Pat.* in Journ. de Bot. iii. 1889, p. 257, and in Bres. Bull. Soc. Myc. Fr. 1890, p. xli.

* Petch: Trop. Agriculturist, Aug. 1912, p. 155.

A very large specimen; judging from the portion sent the entire fruit-body must have been nearly 2 ft. wide.
Distr. Akwa, Agolo, Obu. *N. W. Thomas* (1911).

Polystictus (**Amaurodermus**) **sericatus,** *Lloyd*, Syn. Stip. Polypor. p. 120.
Old Calabar, *J. H. Holland* (1900).
Previously referred to *Fomes rugosus*, from which it differs in the more slender habit, shining, silky pileus and fine, seal-brown pores. A second specimen of this graceful species has recently been received from Uganda.

Polystictus incomptus, *Fr.* Nov. Symb., p. 73.
P. Holstii, P. Henn. Pilz. Ostafr., p. 57, in Engler, Die Pflanzenwelt Ost-Afr.
Agege. *Maitland.* In very moist situations, by the side of streams, *Farquharson* 30.

Polystictus flabelliformis, (*Kl.*) Fr. Nov. Symb., p. 74.
Polyporus flabelliformis Kl., in Linnaea viii. 1833, p. 483.
On a partially submerged log, Ilugboro, *Farquharson* 11.

Polystictus modestus, (*Kze*) *Cke.* in Grevillea xiv. 1885, p. 79.
Polyporus modestus, Kze, in Fries, Linnaea v. 1830, p. 519.
Polystictus albo-cervinus (Berk.), Cke. in Grevillea xiv, 1885, p. 79.
Polyporus albo-cervinus, Berk. in Hook. Journ. Bot. viii. 1856, p. 234. Between Aiyetoro and Ilaro. On decaying wood in rain-forest, *Farquharson* 9.

Polystictus vittatus, (*Berk.*) *Cke.* in Grevillea xiv. 1885, p. 84.
Polyporus vittatus, Berk. in Hook. Lond. Journ. Bot. vi. 1847, p. 505.
Daedalea pavonia, Berk. l.c. p. 507.
The specimens are very much larger than the type, but appear to belong to this species. Pileus sessile, rather thick, fleshy when fresh, margin obtuse. Upper surface clay to pale greyish, with faint darker greyish zones, minutely velvety under a lens, more or less rugulose and with alutaceous felt behind. Hymenium white when fresh, ochraceous when dry; pores of medium size, edges thick and blunt. Spores not seen.
Ibadan. Common in wet season on decaying logs, *Farquharson* 12.

Polystictus obstinatus, *Cke.* in Grevillea xiv. 1885, p. 83.
Trametes obstinatus, Cke. in Grevillea xii. 1883, p. 17.
Fairly common on decaying logs. Usually covered with green algae, etc. *Farquharson* 25.

Polystictus occidentalis, (*Kl.*) *Fr.*, Nov. Symb. p. 90.
Polyporus occidentalis, Kl. in Linnaea viii. 1833, p. 486.
Very common on dead trees, and very variable in habit. Like *Polyporus gilvus* it occasionally shows a tendency to become perennial. *Farquharson* 27.

Polystictus beharensis, *Berk.* in Hook. Journ. Bot. vi. 1854, p. 163.

A beautiful species, near to *P. rigidus*, but differing in the darker, narrowly zoned pileus, and distinctly thin and flexible, not rigid substance.

Very broadly effused along the whole length of a dead piece of branch, margin reflexed. Pileus chestnut brown with narrow darker zones, velvety or silkily tomentose. Flesh very thin, pale brown. Pores very shallow at first, later becoming slightly deeper, and elongated if growing on a vertical surface, pale yellowish avellaneous, 0.3-0.5 mm. in diameter. In section the tissue of the pore walls is filled with rather large crystals of calcium oxalate. The dark-brown hyphae forming the surface of the pileus are sharply marked off from the paler hyphae composing the trama.

Ilugboro. In high forest, *Farquharson* 32; *Maitland* (1913).

Irpex flavus, *Kl.* in Linnaea viii. 1833, p. 488.

Very common. Saprophytic on decaying trees in high forest where there is plenty of moisture, *Farquharson* 26.

Poria Ravenalae, *B. and Br.* in Journ. Linn. Soc. xiv. 1875, p. 53.

Polyporus Büttneri, P. Henn. in Verh. Bot. Ver. Prov. Brand. xxx. 1888, p. 129.

A very distinct species in the steel-grey colour, and irregular shallow pores. Subhymenial hyphae dark-brown, rather rigid, 1·5–2 μ in diameter, running erect and parallel to one another in the walls between the pores in a very characteristic manner. Hymenial elements hyaline. Spores hyaline, cylindrical, 8–10 × 2·5 μ. Apparently confined to monocotyledons. Now known to occur on *Ravenala*, Bamboos, *Cocos*, and *Elaeis*, in Ceylon, Brazil, and Tropical Africa.

Ibadan. Common in moist places on decaying leaves of Oil Palm at latter end of wet season, *Farquharson* 1.

Trametes punicea, *Fr.* Nov. Symb. p. 98 (1851).

Distinct from *Trametes cinnabarina*, Jacq. in the larger pores, which have a tendency to become daedaleoid, and in the darker colour of all the parts. It appears to be a very rare species, and was first described by Fries from Malaya.

Pileus sessile, 3–7 cm. broad by 2–4·5 cm. across, and up to 2 cm. deep behind, cinnabar-red at the obtuse margin, but becoming deep-crimson to blackish behind; surface smooth, not zoned, sometimes radiately rugulose. *Pores* 0·5–1 mm. in diameter, and up to 1 cm. deep behind, cinnabar to dull blood-red, irregular, walls thin, edges obtuse. *Flesh* cinnabar-red, with a dull rusty tinge, 3–6 mm. thick, zoned. *Spores* hyaline, elliptical, 4–5 × 2 μ. *Hyphae* 2–5 μ.

Between Meko and Aiyetoro. On logs in farm clearings, not common, *Farquharson* 15.

Trametes cingulatus, *Berk.* in Hook. Journ. Bot. vi. 1854, p. 164.

Trametes picta, Berk. in Trans. Linn. Soc. ser. 2, ii. 1882, p. 61.

Polyporus argentatus, Cke. in Grev. xv. p. 20.
Polystictus albidus, Mass. in Journ. Bot. 30, 1892, p. 162.
P. villosus, Mass. in Kew Bull. 1906, p. 93.
Ibadan. Common on decaying logs, *Farquharson* 13.

Trametes badia, *Berk.* in Hook. Lond. Journ. Bot. i. 1842, p. 151.
Allied to *Polyporus strigatus*, B., and *Trametes hydnoides*, Fr.
Meko-Aiyetoro. Growing mixed up with *Hexagonia Sacleuxii*, *Farquharson* 29.

Hexagonia hirta, (*Pal.*) *Fr.* Eiper, p. 496.
Favolus hirtus, Pal. Fl. d'Ow. et de Benin, 1804, p. 1, tab. 1.
The four gatherings sent illustrate the extraordinary variability of this species, both as to general habit and pore-size. The pileus varies from thick, rigid, with regular obtuse-walled pores, to thin and fragile, with thin-walled irregular pores, tending to become irpicoid. The pore-size varies from 1 to 3 mm. in diameter, or occasionally larger by imperfect development of a dividing wall, all gradations occurring.
Near Meko. *Farquharson* 16, 17, 19, 20.

Hexagonia Dybowskii, *Pat.* in Bull. Soc. Myc. Fr. 1892, p. 54.
A rare species, first described from the Congo, and since recorded by Bresadola from the same locality and by Patouillard from French Guinea. In its pale colour and general habit it is closely allied to certain species of *Polystictus*, as *P. cristatus*, Cke.
Near Meko, on a fallen log. *Farquharson* 14.

Hexagonia Pobeguini, *Har.* in Bull. Soc. Myc. Fr. viii. 1892, p. 28.
Hexagonia Stuhlmanni, P. Henn. in Engl. Jahrb. xvii. 1893, p. 29.
Between Meko and Aiyetoro, on a small dead tree in bush savannah, October, 1913. *Farquharson* 18.

Hexagonia Sacleuxii, *Har.* in Journ. de Bot. vi. 1892, p. 19.
Between Meko and Aiyetoro, October, 1913, *Farquharson* 21.

Hexagonia discopoda, *Pat. et Har.* in Bull. Soc. Myc. Fr. ix. 1893, p. 209.
These specimens are truly intermediate between *H. discopoda* and *H. Dregeana*, Lév., and render it difficult to say whether these two species can be maintained. They have the more or less sessile habit of *H. Dregeana*, with the small pores of *H. discopoda*, while the colour varies from uniformly dark in some specimens to the two-coloured type of *H. discopoda* in others.
Fairly frequent in moist districts under high bush formations. Agege, Otta, Ibadan, etc., *Farquharson* 22.

THELEPHORACEAE.

Stereum Schomburghii, *Berk.* in Journ. Linn. Soc. xiii. 1873, p. 168.
Hymenochaete olivaceum, Cke. in Grevillea xiv. 1885, p. 11.
Broadly effused, margin reflexed. Hymenium velvety, general-colour dull olive-brown ("Saccardo's Umber", Ridgway

17 O.Y., k). Sterile outgrowths in hymenium of two kinds, (1) slender rough-walled cystidia, cylindrical, apex blunt, 4–5 μ wide, hyaline at apex, pale brownish below; (2) larger smooth-walled hairs, cylindrical, apex blunt, 6–8 μ wide, occasionally 2–3 septate, pale olive-brown. Basidia and spores not seen. Basal hyphae loosely interwoven, olive-brown, 3–4 μ.

Ibadan. Common on old stumps by the side of streams. *Farquharson* 3.

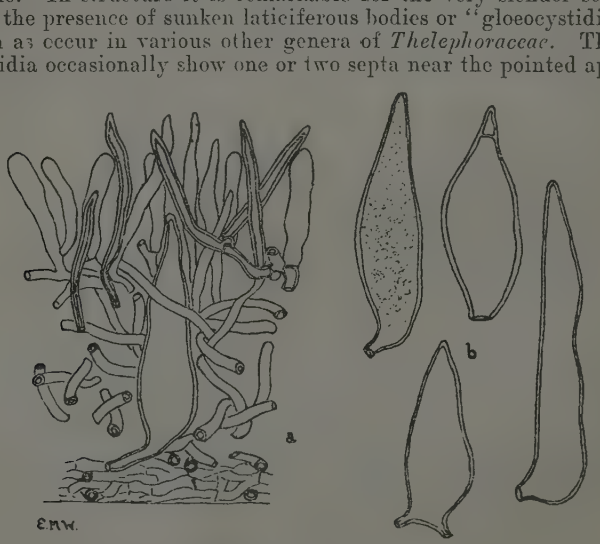
The margin when fresh is white.

Hymenochaete castanea, *Wakefield,* sp. nov.

Sporophore late effusum, tenuum, arcte adnatum, minute velutinum, castaneum, ambitu, pallidius. *Setulae* densae, subuliformes, brunneae vix ab hyphis diversae. *Cystidia* omnino depressa, fusiformia, laevia, tenuiter tunicata, interdum basi bifurcata, flavidula, 47–80 × 11–18 μ. *Basidia* hyalina vel dilute colorata, 27–30 × 5–7 μ. *Sporae* non visae. *Hyphae* subhymeniales laxe intertextae, brunneae, 3·5–4 μ diametro. *Hyphae* basales vix distinctae, conglutinatae, flavido-brunneae.

Nigeria. Ibadan: ad folia palmarum et ad ramos emortuos *Theobromae Cacao, Farquharson* 5, 33.

A remarkably distinct species, marked by the very thin, finely velvety fruit-body, and the rich chestnut colour, varying from "chestnut-brown" (Ridgway 11[1] Orangem), to a much darker shade. In structure it is remarkable for the very slender setae, and the presence of sunken laticiferous bodies or "gloeocystidia," such as occur in various other genera of *Thelephoraceae*. These cystidia occasionally show one or two septa near the pointed apex.



Hymenochaete castanea.

a. Vertical section of sporophore.
b. Various forms of embedded cystidia.

Hymenochaete noxia, *Berk.* in Herb.

Tissue thick, compact, of closely agglutinated brown hyphae,

2–2·5 μ in diameter. Setae long, gradually tapering above, up to 10 μ wide at thickest part, projecting up to 40 μ. Spores not seen.

Ibadan. On bush stumps, and on *Cajanus indicus*, *Farquharson*.

SPHAERIACEAE.

Xylaria involuta, (*Kl.*) Cke in Grevillea xi. 1883, p. 82.
Sphaeria involuta, Kl. in Herb. Hook.
Sphaeria Telfairii, Berk. in Ann. Nat. Hist .iii. 1839, p. 397.
Xylaria Telfairii, (Berk.) Fr.Nov. Symb. 1851, p. 127.
Xylaria tabacina, (Kickx.) Fr.Nov. Symb. 1851, p. 127.
Xylaria gigantea, (Zipp.) Fr.i.c. p. 127
Spores 14–16 × 6–7 μ.
On decaying wood, Ibadan, Ilugboro, *Farquharson* 37.

Thamnomyces Chamissonis, *Ehrenb.* in Nees, Horae Physic. Berolinens, 1820, p. 79, tab. xvii, fig. 1.
Spores 16–21 × 7–9 μ.
Farquharson (1913). Also received from the Gold Coast and Uganda.

Glaziella splendens, *Berk.* (?) in Cke. Grevillea xi. 1883, p. 83.
Xylaria splendens, Berk. in Journ. Linn. Soc. x. 1869, p. 382.
No mature spores are present in the perithecia either of these specimens or of the type of *G. splendens*. The plant is referred to this species on account of the similarity of microscopic structure, which resembles that described by Patouillard* for his *Sarcoxylon aurantiacum*, which may therefore be a synonym. The fructification when fresh is covered externally by a bright, sulphur-yellow, furfuraceous layer. Beneath this is a black zone, in which the perithecia are immersed, and the innermost layer is pale and gelatinous, traversed by dark bands radiating inwards from the black zone. The centre of the fructification is hollow and, when fresh, filled with water.
On wood, *Farquharson*, 35.

L.—MISCELLANEOUS NOTES.

MR. A. WAINWRIGHT, MR. J. E. T. HARTLEY.—Mr. A. Wainwright, of Queens' College, Cambridge, and Mr. J. E. T. Hartley, of Magdalene College, Cambridge, have been appointed by the Secretary of State for the Colonies, on the recommendation of Kew, Assistant Superintendents of Agriculture in Nigeria.

MR. C. H. OLDHAM.—Mr. C. H. Oldham, lately a member of the gardening staff of the Royal Botanic Gardens, has been appointed, on the recommendation of Kew, a Sub-Inspector for the purposes of the Destructive Insects and Pests Act under the Board of Agriculture and Fisheries.

* Patouillard. Bull. Soc. Myc. Fr. xxvii. 1911, p. 331.

Mr. W. N. C. Belgrave.—Mr. W. N. C. Belgrave, B.A., of St. John's College, Cambridge, has been appointed by the Secretary of State for the Colonies, on the recommendation of Kew, Assistant Mycologist in the Department of Agriculture, Federated Malay States.

Nymphaea stellata in the open.—For several months during the summer some plants of *Nymphaea stellata* with blue flowers have made a very pleasing display in the Water-lily Pond, situated near the Southern Pinetum. There is grown here a good selection of the ordinary species and hybrid varieties, which give a charming variety of colours—white, pink, yellow and crimson. From them the blue one is distinct in three notable respects: in colour, in the flowers standing 1 to 2 feet out of the water, and in their remaining fully open through the afternoon. The last is a rather important qualification in a public garden chiefly frequented during the afternoons.

Nymphaea stellata is not, of course, genuinely hardy, and the plants grown in this pond are not put out until early June, the tubers being housed during the winter and started into growth under warmth in spring. But where conveniences for this winter and spring protection exist, the blue water-lily is evidently well worth experimenting with as a summer aquatic in the open air. At Kew they have for several years past kept up a continuous show in this Pond for three or four months; and in full season from eight to over a dozen flowers may often be counted open at one time on a plant. This pond is slightly warmed by an inflow of condensed steam, etc., from a pumping engine, but this can have little effect on the water at the opposite end, 30 or 40 yards away, where a plant of the blue water-lily is blossoming excellently.

It should be understood that the *N. stellata* of European Water-lily collections is not the plant known to Indian botanists as *N. stellata*. W. J. B.

Abnormal Condition of the Wood of Thuya plicata.—In the spring of 1913 a log of wood from the base of a recently-felled tree of *Thuya plicata* was presented to the Forestry Museum at Kew by Mr. Reginald N. Rogers, of Carwinion, Falmouth. On arrival it was seen that growth had been rapid, but there was nothing to indicate any abnormality, and it was not until after the log had been cut into three longitudinal sections, some three months later, that any peculiarity was noticeable. After leaving the saw, the wood was placed in an open shed to season, and a few weeks later curious longitudinal depressions had formed in the surface of each piece, whilst numerous tiny cracks were to be seen in the transverse sections. By January, 1914, considerable shrinkage had taken place, and the surface of each longitudinal piece presented a ridged appearance, the channels in some cases being nearly a quarter of an inch deep. At the same time the cracks in the transverse faces had broadened at the base, so forming roughly triangular fissures. At this time the surfaces were planed, and it was found that the fissures extended for a considerable distance

into the wood, suggesting in appearance the galleries of boring insects.

An idea of the appearance of the wood at the present time may be gleaned from the fact that in two separate areas, each 3 inches square, the fissures number 31 and 52 respectively. In most instances they are still roughly triangular, and the base varies in length from $\frac{1}{12}$ to $\frac{7}{12}$ of an inch, about $\frac{1}{6}$ of an inch being the average. In very few cases do the fissures extend through the autumn wood, though here and there are found evidences of a tendency for the summer and autumn wood to separate. The depth and straightness of the fissures can be appreciated from the fact that in a log $3\frac{1}{2}$ feet in length a wire can be easily inserted to a depth of from 12 to 25 inches in many of the holes.

The present condition of the wood appears to be due to local shrinkage during drying and to be connected with abnormal softness and weakness of certain parts. Rapid growth encouraged by mild and moist atmospheric conditions may have been responsible for undue softness of the summer wood. The tree had been grown as an ornamental specimen and was said to have been about 80 feet high. At $3\frac{1}{2}$ feet from the ground the trunk measured 25 inches in diameter and showed 48 annual rings. The rings vary a good deal in width not only between those of different years, but the same ring varies in different parts of the circumference. Thus, whilst a ring in the depressions of the trunk, which occur between the swellings corresponding with the buttresses, may be but $\frac{1}{8}$ of an inch wide, the same ring in another place may be from $\frac{5}{12}$ to $\frac{7}{12}$ of an inch wide.

In weight the wood is about $22\frac{1}{2}$ lbs. to the cubic foot. Hough gives the weight of native grown wood as 23·66 lbs. per cubic foot.

From the fact of the wood of this tree being of considerable value in Western North America and of the species growing well in many parts of the British Isles, it has been planted rather extensively in some places under the various names of *T. plicata*, *T. gigantea* and *T. Lobbii*, for silvicultural purposes. It would, however, be well to make a thorough investigation of the wood from various parts of the country in order to prove whether it is really likely to be of commercial value after it is grown before further extensive plantings are made. Very fair samples of wood have been received from Western Scotland which, after seasoning for several years, are quite sound, but in a specimen grown in Devonshire a few triangular fissures occur. In Ireland it is said to grow well for a certain time and to form good scaffold poles and pit props, but as the tree advances in age the wood is apt to be troubled by heart rot. So far as can be seen at present, inferior wood is to be expected from trees growing under very mild climatic conditions where the atmosphere is heavily charged with moisture.

W. D.

Botanical Magazine for September.—The plants figured are *Echinopanax horridus*, Dene and Planch. (t. 8572); *Hamamelis vernalis*, Sargent (t. 8573); *Pimelea ferruginea*, Labill. (t. 8574); *Aconitum rotundifolium*, Kar. and Kir. (t. 8575), and *Tillandsia Benthamiana*, Klotzsch, var. *Andrieuxii*, Mez (t. 8576).

Echinopanax horridus is one of several names for a striking Araliaceous plant which is a native of the coast and islands of North-West America from Sitka and the Charlotte Sound to the Oregon, the borders of California and the Rocky Mountains; also of Japan, where Professor Sargent has observed it growing freely in the dense shade of the hemlock spruce forests. In Japan it is known as Ari Bouki. It is a shrub, growing from 3 to 10 feet high, with a prickly stem, creeping below and leafy at the top, furnished with palmately 5–9-lobed leaves, 6–10 inches across. The plate was prepared from a plant purchased in 1909 from Messrs. Lemoine of Nancy. At Kew it is necessary in the spring to protect the young growths from frost.

The *Hamamelis* is a native of the South-Eastern United States, and though closely allied to *H. virginiana*, Linn., the time of flowering, from midwinter to spring, is the same as that of *H. japonica*, Sieb. and Zucc. It may also be distinguished from *H. virginiana*, which flowers during the autumn, while still in full leaf, by the habit of spreading by stolons, by having the calyx-lobes red on the inner face and a more abundant and persistent pubescence on the twigs and leaves, the latter of which are dull and rather glaucous beneath. As a garden plant it has not so far proved so attractive as the Chinese and Japanese species. It was first received at Kew in 1909 from the Arnold Arboretum.

The *Pimelea*, a West Australian plant, was first introduced in 1824, and figures of it are met with in various works under the names of *P. decussata*, R. Br. and *P. diosmifolia*, Lodd. Its flowers vary in colour from pale pink to a rather deep red, and are arranged in terminal globose heads, each of which has four subtending greenish-pink bracts about $\frac{1}{3}$ inch long. A distinctive appearance is imparted to the inflorescence by the presence of spreading white hairs on the lower part of the perianth-tube.

Aconitum rotundifolium is one of the most characteristic species from Western Central Asia, where it is sometimes found growing at an altitude of 17,000 feet above sea-level. It has unusually small tubers which, on tasting, do not produce the tingling sensation caused by poisonous aconites. The inflorescence is a raceme or narrow panicle and is pubescent or villous. The flowers are about $\frac{3}{4}$ inch long, and are greenish-white with violet veins, somewhat flushed with purple or violet. A plant from which the figure was prepared was purchased in 1912 from Messrs. Regel and Kesselring, of St. Petersburg, under the name of *A. albo-violaceum*, which is a species of a different section.

The *Tillandsia* has been figured from a plant sent to Kew in 1912 by Mr. C. H. Lankester, Cachí, Costa Rica. It was first discovered at Chalco in Mexico by Mr. G. Andrieux. It occurred as an epiphyte on a *Quercus* and is distinguishable from the typical form by the smaller flowers, purple petals, shortly acute sheath of the scape, and by the upper bracts being rounded at the apex.